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# THE ELECTRIC CONDUCTIVITY OF KEROSENE AND GASOLINE AS A FUNCTION OF THE TEMPERATURE

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J. Herbert Jones in the Phil. Mag. for July, 1925, gives the results of experiments on The Influence of the Surrounding Medium on Frictional Electricity. In one of these experiments he uses pure paraffin oil which he heats by a coil of lead piping through which steam is blown. It was found that the resistance of the oil decreases steadily with a rise in temperature until the temperature reached 75°C. The resistance then seemed to remain fairly constant until the temperature rose further to 90°C. At this temperature the resistance seemed to break down suddenly.

Correspondence with the Bureau of Standards and the Mellon Institute inidcated that no work had been done on the resistance of kerosene and gasoline as a function of the temperature.

We have tried to find what kind of a phenomenon occurs with kerosene. The kerosene was put into a glass conductivity cell heated by a home-made heating coil. This cell was connected in series with an electroscope. The electroscope was then charged through the kerosene by means of an electrophorus and the time required for the leaf to fall through ten divisions on the scale was taken by means of a stop-watch.

This arrangement worked very satisfactorily for the kerosene and with it we abtained the following curve. (See fig. 1.)

We next tried to apply this method to gasoline. The resistance of the gasoline was so low that the deflection of the leaf was too rapid to be measured with a stop-watch.

But by charging a condenser through gasoline and then discharging it through a galvanometer we know that its resistance decreases very rapidly with an increase of temperature. So far we have been unable to get sufficient quantitative data to plot a curve and work out the constants.

We are now trying to determine the effect of temperature on the rate at which an electrostatic charge will leak across silk immersed in gasoline, and also the effect of temperature on the pro-

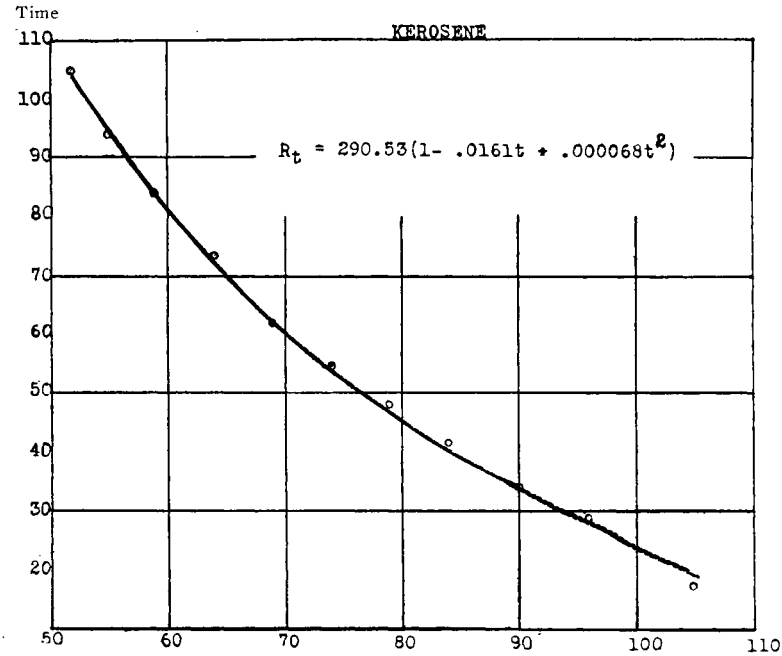

Fig. 1

duction of an electrostatic charge by friction between silk and fur immersed in gasoline.

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## A NEW INSTRUMENT FOR THE DETERMINATION OF YOUNG'S MODULUS

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The apparatus used for the determination of Young's modulus in the elementary laboratory at Drake has been the vertical suspended wire type, in which the sample under test is loaded and readings taken directly by means of a vernier attached to the wire. Although the readings are accurate to one one-hundredth of a centimeter, the scale cannot be conveniently read, the measurement of the length of the wire necessitates the use of a ladder, and the heavy weights are not easily handled. It is hoped that this new instrument will facilitate the experiment, although it is recognized that the weight of the wire, and friction in the bearings and gauge, may introduce slight errors.